

WHAT IS CLAIMED IS:

1. A silencer system configured to allow for thermal growth thereof while attenuating noise created by expansion of high-pressure fluid flowing therethrough, the silencer system comprising:

a tubular inner sleeve having a sleeve inlet and a sleeve outlet;

a tubular flexible bellows having upper and lower ends and having the inner sleeve concentrically disposed in spaced relation therewithin to define an inner annular gap, the bellows being affixed to the inner sleeve at the upper end such that the inner annular gap is closed off;

a tubular vent stack having the bellows concentrically disposed in spaced relation therewithin to define an outer annular gap, the vent stack being affixed to the bellows at the lower end such that the outer annular gap is closed off; and

a muffler disc mounted above the sleeve outlet;

wherein the bellows is configured to allow for axial and lateral movement of the inner sleeve relative to the vent stack.

2. The silencer system of Claim 1 wherein the muffler disc is oriented relative to the sleeve outlet such that the fluid impinges the muffler disc prior to creating shockwaves.

3. The silencer system of Claim 2 wherein the muffler disc is disposed in spaced relation to the sleeve outlet.

4. The silencer system of Claim 2 further comprising:

a tubular inlet diffuser mounted on the upper end of the bellows between the sleeve outlet and the muffler disc and having a plurality of inlet diffuser passages extending radially therethrough;

wherein the inlet diffuser passages are arranged such that fluid exiting therethrough may enter the vent stack in a predetermined pattern.

5. The silencer system of Claim 4 wherein the predetermined pattern is configured such that fluid enters the vent stack in a substantially uniformly distributed pattern.

6. The silencer system of Claim 4 wherein the inlet diffuser is sized to be complementary to the upper end of the bellows.

7. The silencer system of Claim 4 wherein the muffler disc is sized to be complementary to the inlet diffuser.

8. The silencer system of Claim 4 further comprising a bellows bulkhead interposed in sealing engagement between the

inner sleeve and the bellows at the upper end thereof and being configured to close off the inner annular gap.

9. The silencer system of Claim 1 further comprising:

a stack bulkhead interposed in sealing engagement between the vent stack and the bellows at the lower end thereof and being configured to close off the outer annular gap; and

a drain coupling mounted in the stack bulkhead.

10. The silencer system of Claim 1 wherein the muffler disc is fabricated from a porous material.

11. The silencer system of Claim 10 wherein the porous material is metal foam.

12. The silencer system of Claim 10 wherein the porous material is wire mesh.

13. The silencer system of Claim 12 wherein the wire mesh is fabricated from sintered stainless steel.

14. The silencer system of Claim 4 further comprising:

a stack reducer interposed in the vent stack and configured to reduce the diameter thereof; and

a blowoff silencer mounted atop the vent stack, the blowoff silencer including:

a tubular vent diffuser fluidly connected to the vent stack and having a plurality of vent diffuser passages extending radially therethrough; and

a tubular blowoff silencer shell having the vent diffuser concentrically disposed in spaced relation therewithin to define an expansion chamber, the silencer shell extending laterally around the vent stack and upwardly past the vent diffuser;

wherein fluid flows radially outwardly through the vent diffuser passages and into the expansion chamber in a predetermined pattern.

15. The silencer system of Claim 14 wherein the blowoff silencer further includes:

a tubular vent muffler having the vent diffuser concentrically positioned therewithin;

wherein a plurality of jets are defined by the flow of the fluid out of the vent diffuser passages, the vent muffler being oriented relative to the vent diffuser such that the jets impinge the vent muffler prior to creating shockwaves.

16. The silencer system of Claim 14 wherein the blowoff silencer further includes:

an acoustic core assembly disposed within the expansion chamber above the vent diffuser, the acoustic core assembly including:

a tubular inner core having a perforated inner and outer face sheets with acoustic pack material being disposed therebetween, the inner face sheet defining an inner flow path; and

a tubular outer core having a perforated inner face sheet disposed in spaced relation to the blowoff silencer shell with acoustic pack material being disposed therebetween;

wherein the inner core is concentrically disposed in spaced relation to the outer core with an annular core passageway defined therebetween such that fluid flows upwardly from the expansion chamber through the inner flow path and the annular core passageway before exiting the blowoff silencer.

17. The silencer system of Claim 16 wherein the acoustic pack material is glass fiber material.

18. The silencer system of Claim 16 wherein the expansion chamber includes sound-absorbing material disposed at a lower portion thereof.

19. The silencer system of Claim 18 wherein the sound-absorbing material is scoria.

20. The silencer system of Claim 14 further comprising an end cap disposed in sealing engagement to the vent diffuser and configured for blocking fluid flowing therethrough such that the fluid passes radially outwardly through the vent diffuser passages.